Installing the HSSI Net Module in a System 5000 Platform

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Bay Networks

Bay Networks

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Canada Requirements Only

Canadian Department of Communications Radio Interference Regulations

This digital apparatus (HSSI Net Module) does not exceed the Class A limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

Règlement sur le brouillage radioélectrique du ministère des Communications

Cet appareil numérique (HSSI Net Module) respecte les limites de bruits radioélectriques visant les appareils numériques de classe A prescrites dans le Règlement sur le brouillage radioélectrique du ministère des Communications du Canada.

Canada Requirements Only *(continued)*

Canada CS-03 Rules and Regulations

Note: The Canadian Department of Communications label identifies certified equipment. The certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent the degradation of service in some situations.

Repairs to certified equipment should be made by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Notice: For equipment using loopstart lines, please note that the Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the RENs of all the devices does not exceed 5.0. The REN is located on the "FCC Rules Part 68" label located on the bracket of the module, or on the back of the unit.

Canada CS-03 -- Règles et règlements

Note: L'étiquette du ministère des Communications du Canada indique que l'appareillage est certifié, c'est-à-dire qu'il respecte certaines exigences de sécurité et de fonctionnement visant les réseaux de télécommunications. Le ministère ne garantit pas que l'appareillage fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer l'appareillage, s'assurer qu'il peut être branché aux installations du service de télécommunications local. L'appareillage doit aussi être raccordé selon des méthodes acceptées. Dans certains cas, le câblage interne du service de télécommunications utilisé pour une ligne individuelle peut être allongé au moyen d'un connecteur certifié (prolongateur téléphonique). Le client doit toutefois prendre note qu'une telle installation n'assure pas un service parfait en tout temps.

Les réparations de l'appareillage certifié devraient être confiées à un service désigné par le fournisseur. En cas de réparation ou de modification effectuées par l'utilisateur ou de mauvais fonctionnement de l'appareillage, le service de télécommunications peut demander le débranchement de l'appareillage.

Pour leur propre sécurité, les utilisateurs devraient s'assurer que les mises à la terre des lignes de distribution d'électricité, des lignes téléphoniques et de la tuyauterie métallique interne sont raccordées ensemble. Cette mesure de sécurité est particulièrement importante en milieu rural.

Attention: Les utilisateurs ne doivent pas procéder à ces raccordements eux-mêmes mais doivent plutôt faire appel aux pouvoirs de réglementation en cause ou à un électricien, selon le cas.

Avis: Veuillez prendre note que pour tout appareillage supportant des lignes de type "loopstart," vous pouvez utiliser le Ringer Equivalence Number (REN) attribué à chaque terminal pour déterminer le nombre maximal de terminaux qui peuvent être branchés à votre interface de téléphones. Le raccordement à l'interface pourra se composer de toute combinaison de terminaux, pour autant que la somme des RENs ne dépasse pas cinq. Le REN figure sur l'étiquette "FCC Rules Part 68" située sur le support du module ou à l'arrière de l'unité.

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About This Guide

Read this guide if you are responsible for installing a High-Speed Serial Interface (HSSI) Net Module in a Bay Networks® System 5000™ platform.

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Install the HSSI net module in the System 5000	Chapter 1
Interpret the LEDs on the System 5000 and the HSSI net module	Chapter 2
Review information about the cables you can attach to the HSSI net module	Appendix A
Review the requirements for operating the HSSI net module in Europe	Appendix B

Conventions

ellipsis points	Horizontal (. . .) and vertical (⋮) ellipsis points indicate omitted information.
italic text	Indicates variable values in command syntax descriptions, new terms, file and directory names, and book titles.
quotation marks (“ ”)	Indicate the title of a chapter or section within a book.
separator (>)	Separates menu and option names in instructions and internal pin-to-pin wire connections. Example: Protocols > AppleTalk identifies the AppleTalk option in the Protocols menu. Example: Pin 7 > 19 > 20

Acronyms

DCE	data communications equipment
DSU	data service unit
DTE	data terminal equipment
HSSI	high-speed serial interface
LED	light emitting diode
SELV	safety extra-low voltage
TNV	telecommunications network voltage
WAN	wide area network

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Sydney, Australia	61-2-9927-8800	61-2-9927-8811
Tokyo, Japan	81-3-5402-0180	81-3-5402-0173

Chapter 1
Installing the HSSI Net Module

This chapter describes the tasks that you perform to install the HSSI net module in a System 5000 platform.

To install the HSSI net module:

1. Remove the router module on which you want to install the net module.
2. Install the net module.
3. Replace the router module.

You need the following tools and materials for installation:

- Medium flat-tip screwdriver
- Medium Phillips screwdriver
- Grounded antistatic mat and antistatic wrist strap

Caution: The System 5000 equipment contains electronic components that are sensitive to static electricity. Static discharge from your clothing or fixtures around you can cause damage. When working with printed circuit boards, take all possible precautions to prevent static discharge damage.

Place the module on a grounded antistatic mat until you are ready to install the module. If you do not have an antistatic mat, wear an antistatic wrist strap to free yourself of static electricity before touching the module.

Removing the Router Module

To remove the router module from the chassis:

1. **Use a flat-tip screwdriver to loosen the two captive screws that secure the module to the chassis.**

   These screws are spring-loaded to pop out when you unscrew them from the chassis. Locking washers hold the screws in place on the router module front panel.

2. **Rotate the top and bottom inserter/extractor levers away from the center of the front panel to release the module from the backplane.**

3. **Slide the module out of the chassis (Figure 1-1).**

   Use both hands to support the module while you slide it out of the chassis.

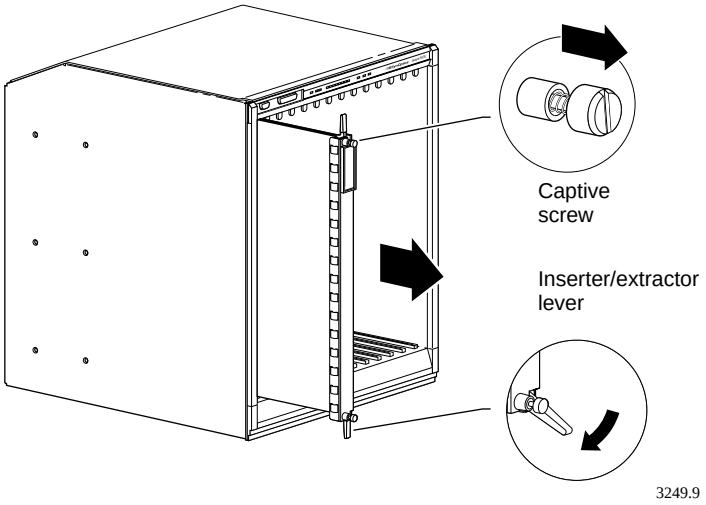

Figure 1-1. Removing the Router Module

4. **Place the module (with the component side facing up) on an antistatic mat until you are ready to install it in the chassis.**

Note: If you plan to keep the module out of the chassis for more than a few minutes, install a filler panel in the chassis slot to maintain the cooling airflow in the chassis.

Installing the HSSI Net Module

Before you install the HSSI net module, be sure to attach an antistatic wrist strap.

To install the HSSI net module in the chassis:

1. **Remove one of the filler panels from the router module by removing the two screws that hold it in place (Figure 1-2).**

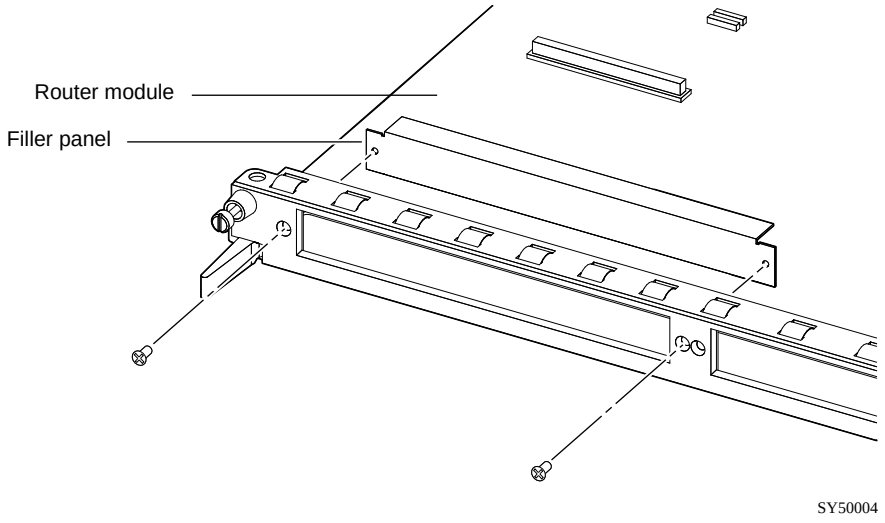

Figure 1-2. Removing a Filler Panel

2. **Tilt the module to position it next to the open slot, then slide the module under the metal frame (Figure 1-3).**

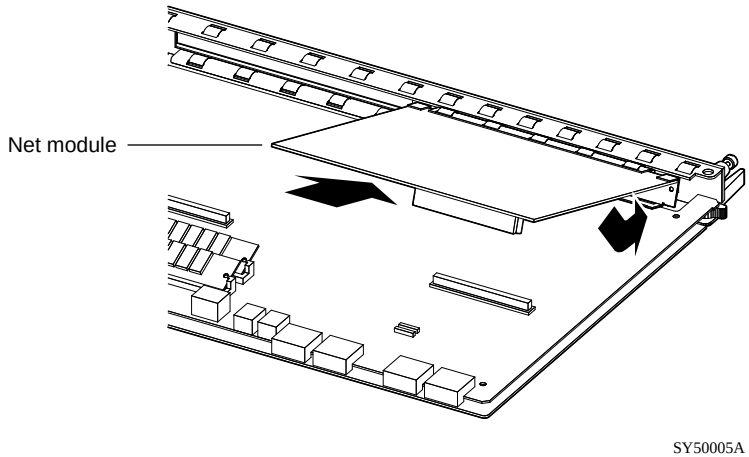

Figure 1-3. Positioning the Net Module

3. **Align the module connector with the connector on the router module (Figure 1-4).**

Caution: Make sure that the net module is parallel to the router module. If the connectors are not aligned properly, you will bend the pins and the connector on the router module, which may cause a short circuit.

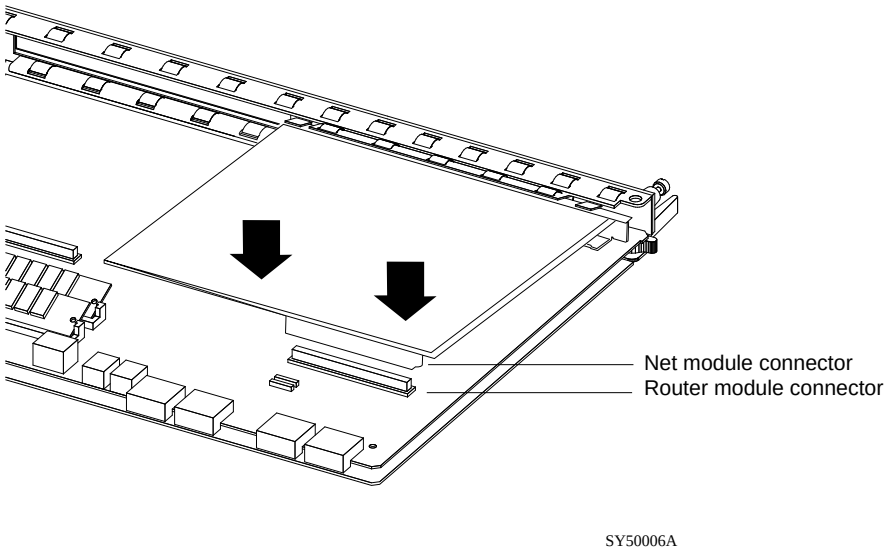

Figure 1-4. Aligning and Seating the Net Module

4. **Press down on the HSSI net module to seat it on the router module (Figure 1-4).**

   When you push the net module into the router module connector, it should attach easily. If there is any resistance, *stop* and recheck the pins before you continue.

5. **Insert and tighten the two screws on the front of the router module (Figure 1-2 on page 1-3).**

   Use the screws you removed from the filler panel to secure the module.

Note: If you are installing a net module that is a different type than the one you removed, you need to edit the router configuration file to reflect the change. See *Configuring and Managing Routers with Site Manager* for information.

Installing the Router Module

You can install the router module in the chassis without interrupting service to other modules, as long as you install the router module in the same slot from which you removed it. This procedure is called *hot-swapping*. In this section, you hot-swap the router module.

Note: If you install the router module in a slot other than the one from which you removed it, you must set the backplane connections through the service port terminal and edit the router configuration file. For more information, see *Using the Model 5380 Ethernet and the Model 5580 Token Ring Routers*.

To install the router module in the chassis:

1. **If there is a filler panel in the chassis slot in which you want to install the router module, remove the filler panel (Figure 1-5).**

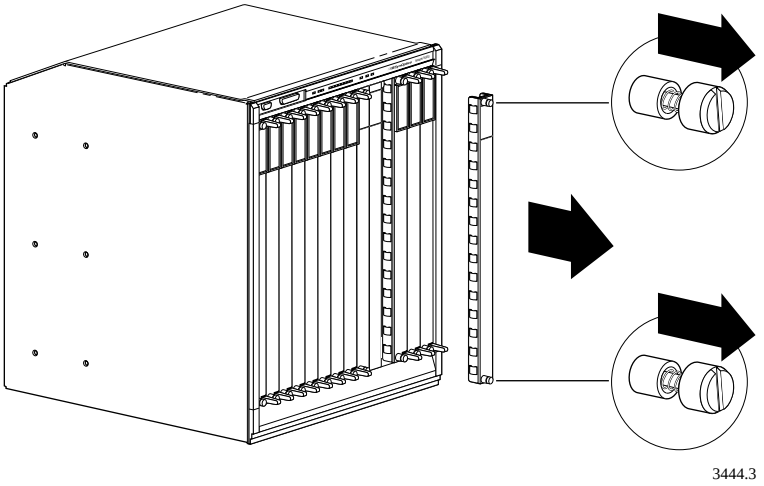

Figure 1-5. Removing a Filler Panel

2. **Verify that the flash memory card is installed on the router module.**

   If you need to install a flash memory card, see *Using the Model 5380 Ethernet and the Model 5580 Token Ring Routers*.

3. **Move the module inserter/extractor levers to the vertical position (Figure 1-6).**

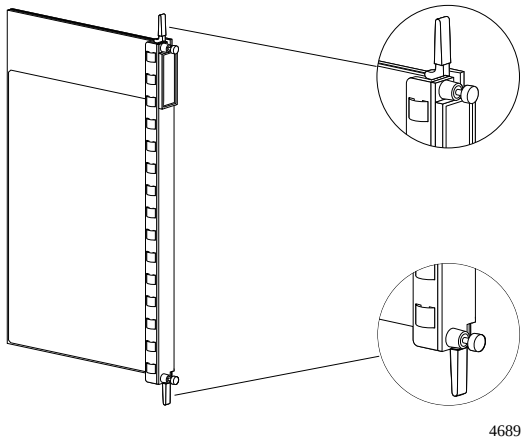

Figure 1-6. Inserter/Extractor Levers in the Vertical Position

4. **Align the top and bottom edges of the router module with the guides at the top and bottom of the chassis slot.**

5. **Slide the module into the chassis until you feel it engage the backplane.**

   The inserter/extractor levers should still be in the vertical position and in contact with the front of the chassis. *Do not* push the module all the way into the chassis.

6. **Seat the module by rotating both inserter/extractor levers toward the center of the module front panel to the horizontal position (Figure 1-7).**

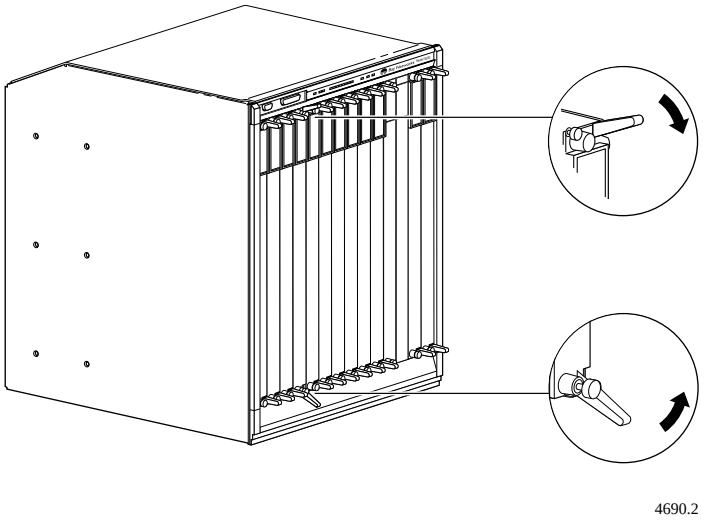

Figure 1-7. Seating the Router Module

7. **Use a flat-tip screwdriver to tighten the captive screws at the top and bottom of the module front panel.**

Note: Tighten the captive screws so they are snug. Overtightening the screws may damage the chassis or the router module.

Chapter 2
Checking the LEDs

This chapter describes the LEDs on the System 5000 and the HSSI net module.

System 5000 LEDs

Immediately after you install the router module, all System 5000 LEDs (Figure 2-1) light from amber to green, and then turn off. If the router module is installed and functioning properly, the following System 5000 LEDs will light during the diagnostic and boot sequence:

- The annunciator LED is amber.
- The Run LED flashes green to indicate that the diagnostics are running.

After the diagnostics have completed successfully:

- The Boot LED is green to indicate the boot process. The LED turns off when the boot process is complete.
- The Run LED is off while the router module is booting.
- The Diag LED remains off to indicate that the diagnostics have completed successfully.

When the router module finishes booting and is operational, the annunciator, Run, and BP LEDs are green; the Net1, Net2, and PPX LEDs are green if these options are installed.

See *Using the Model 5380 Ethernet and the Model 5580 Token Ring Routers* for descriptions of each LED.

Figure 2-1 illustrates the LEDs on the System 5000.

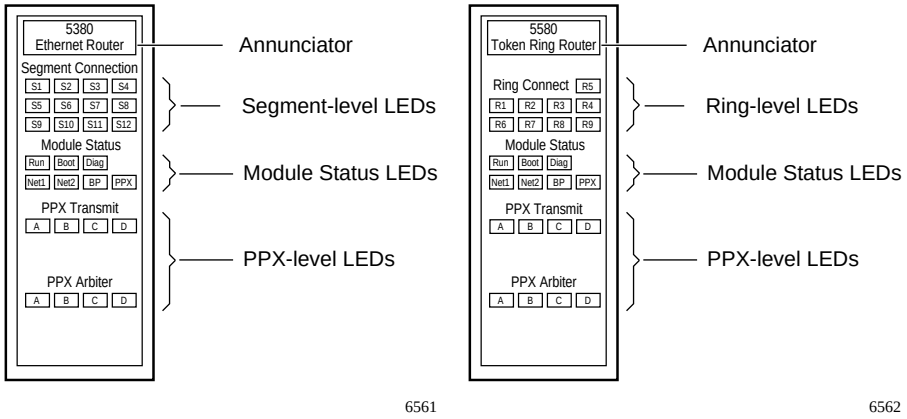

Figure 2-1. System 5000 LEDs

HSSI Net Module LEDs

The HSSI net module has four LEDs labeled LC, TM, CA and TA (Figure 2-2). Table 2-1 describes the function of each LED.

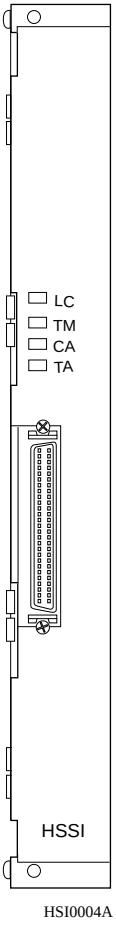

Figure 2-2. HSSI Net Module LEDs

Table 2-1. HSSI Net Module LEDs

LED	Function
LC	Line loopback. Lights when the DTE is in line loopback mode.
TM	Test mode. Lights when the DCE is in test or diagnostics mode.
CA	DCE ready. Lights when the DCE is enabled and ready to transmit and receive data.
TA	DTE ready. Lights when the DTE is enabled and ready to transmit and receive data.

Appendix A
Cabling Requirements for the HSSI Net Module

This appendix provides information about the cabling requirements for the HSSI net module.

For HSSI compliance, you must use an Order No. 7830 or 7831 cable. Order No. 7830 is a 10-foot cable; Order No. 7831 is a 50-foot cable. Figure A-1 and Table A-1 provide cabling information.

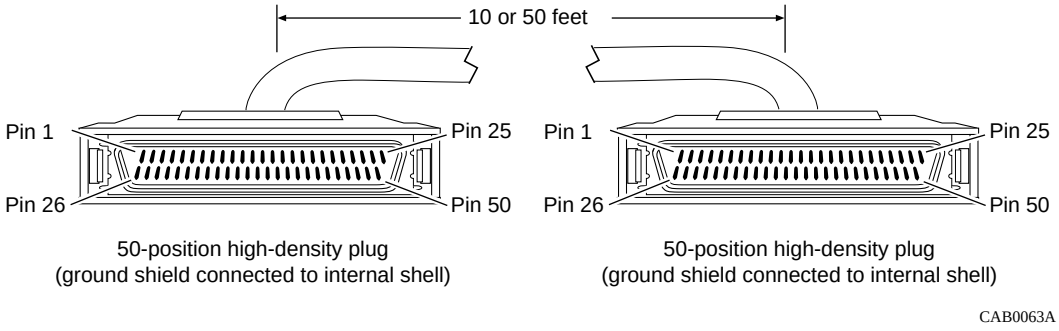

Figure A-1. HSSI DCE to DTE Cable (Order No. 7830/7831)

Table A-1. HSSI DCE to DTE Cable (Order No. 7830/7831) Pin Assignments

Bay Networks Termination		Remote Termination	
Pin	**Signal**	**Pin**	**Signal**
1	Signal Ground	1	Signal Ground
26	Signal Ground	26	Signal Ground
2	Receive Timing+	2	Receive Timing+
27	Receive Timing-	27	Receive Timing-
3	DCE Available+	3	DCE Available+
28	DCE Available-	28	DCE Available-
4	Received Data+	4	Received Data+
29	Received Data-	29	Received Data-
5	Line Loopback+	5	Line Loopback+
30	Line Loopback-	30	Line Loopback-
6	Send Timing+	6	Send Timing+
31	Send Timing-	31	Send Timing-
7	Signal Ground	7	Signal Ground
32	Signal Ground	32	Signal Ground
8	DTE Available+	8	DTE Available+
33	DTE Available-	33	DTE Available-
9	Terminal Timing+	9	Terminal Timing+
34	Terminal Timing-	34	Terminal Timing-
10	Loopback CKT A+	10	Loopback CKT A+
35	Loopback CKT A-	35	Loopback CKT A-
11	Send Data+	11	Send Data+
36	Send Data-	36	Send Data-
12	Loopback CKT B+	12	Loopback CKT B+
37	Loopback CKT B-	37	Loopback CKT B-
24	Test Mode+	24	Test Mode+
49	Test Mode-	49	Test Mode-
13	Signal Ground	13	Signal Ground
38	Signal Ground	38	Signal Ground
19	Signal Ground	19	Signal Ground

(continued)

Table A-1. HSSI DCE to DTE Cable (Order No. 7830/7831) Pin Assignments *(continued)*

Bay Networks Termination		Remote Termination	
44	Signal Ground	44	Signal Ground
25	Signal Ground	25	Signal Ground
50	Signal Ground	50	Signal Ground

Appendix B
Requirements for European Operation

This appendix provides technical specifications and notes for operating the HSSI net module in Europe.

Installation Requirements

The net modules are approved only for installation in a host, and with host attachments, which are either type-approved for such apparatus or, if supplied after March 1, 1989, are marked with or supplied with a statement that the host is supplied under the terms of General Approval No. NS/G/1234/J/100003.

Installation of the HSSI net modules in a System 5000 will satisfy the conditions stated in this appendix. The System 5000 is supplied under the terms of General Approval No. NS/G/1234/J/100003.

Power Requirements

The HSSI net modules draw power from the host chassis. Table B-1 lists the power requirements.

Table B-1. HSSI Net Module Power Requirements

Voltage	Amperage
+5 VDC	1.8 A
+12 VDC	0.42 A

The power drawn from the host chassis combined with that required for any other net modules and accessories must not exceed the power rating of the host chassis.

You must install the net modules so as not to impair the integrity of the network protection from hazardous voltages used or generated internally by the host chassis.

Clearance and Creepage Distances

You must maintain the clearance and creepage distances (shown as X and Y, respectively, in Table B-2 and Figure B-1) between the HSSI net module and the following:

- The host chassis in which it is installed
- Any adjacent net modules installed in the host chassis

The exception to this rule is the edge connector, which is located on the host chassis backplane, where no minimum distance applies.

Table B-2. HSSI Net Module Clearance and Creepage Distances

Clearance (X)	Creepage (Y)	Voltage Used or Generated by Other Parts of the Host or Expansion Card
2.0 mm	2.4 (3.8) mm	Up to 50 V rms or VDC
2.6 mm	3.0 (4.8) mm	Up to 125 V rms or VCC
4.0 mm	5.0 (8.0) mm	Up to 250 V rms or VDC
4.0 mm	6.4 (10.0) mm	Up to 300 V rms or VDC

The creepage distances apply to a typical office environment. If the host chassis is exposed to conductive pollution or dry nonconductive pollution that could become conductive due to condensation, the creepage distances shown in parentheses in Table B-2 apply.

You determine the clearance and creepage distances between adjacent points as follows (Figure B-1):

- The clearance distance (X) is the shortest distance between two points, measured through the air.
- The creepage distance (Y) is the shortest distance between two points, measured across a surface.

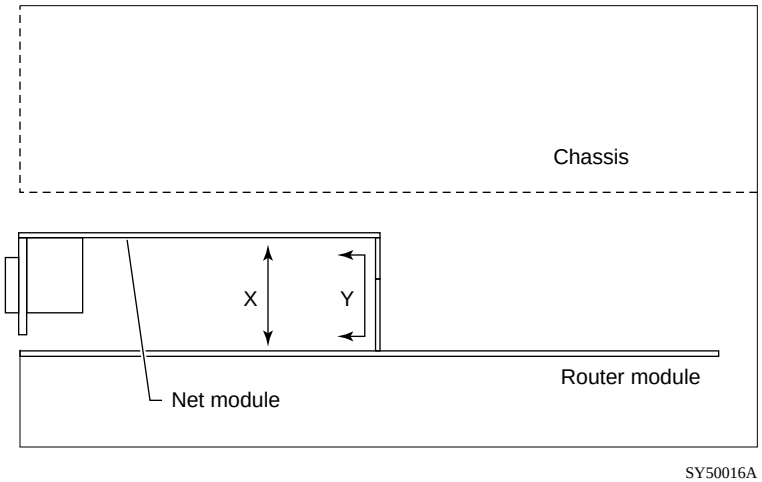

Figure B-1. HSSI Net Module Clearance and Creepage Distances

If you have any questions, consult a telecommunications safety engineer.

Note: Failure to install a net module according to these instructions will invalidate the General Approval.

Safety Status

This section describes the safety status of the HSSI net module, as defined by European Standard EN41003.

Table B-3 lists the safety status of interconnection points on the HSSI net module to the connectors on other equipment.

Table B-3. HSSI Net Module Safety Status

Port Location	Port Description	Type of Circuit
COM1	HSSI	Telecommunications network voltage (TNV) at safety extra-low voltage (SELV) levels
P1	Host port	SELV